Narrow Walls That Work

APA
THE ENGINEERED WOOD ASSOCIATION

A Simple Solution for Meeting Narrow Wall Bracing Requirements

AND BUILDING A STRONGER, SAFER HOME.

APA's Narrow Wall Bracing Method, combined with walls that are fully sheathed with plywood or OSB, helps builders meet the bracing requirements of the International Residential Code (IRC) for narrow walls next to garage doors, build a stronger home, and deliver value to the customer. It's a simple site-built system, based on typical wood-framed construction techniques.

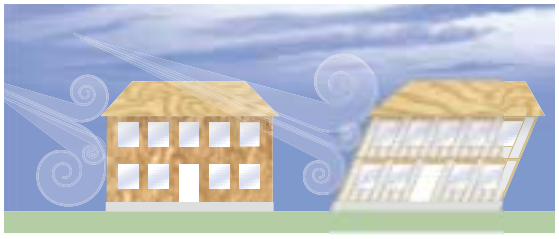
All residential builders are familiar with corner bracing. What they may not realize is that Section R602.10.4 of the IRC requires 4-foot wide bracing segments near the corners of buildings and at prescribed intermediate points. With the rapid adoption of the new IRC, enforcement of this requirement is becoming widespread.

The code also requires a 48-inch bracing wall next to garage openings. But many home designs show wall segments adjacent to the garage opening that are as narrow as 16 inches.

THE SOLUTION:

Sheath the house in plywood or OSB and use APA's Narrow Wall Bracing Method. Builders can reduce garage wall bracing width and still provide bracing performance equivalent to the prescriptive code requirements. Note that this method is limited to garage bracing only. For wall bracing as narrow as 24 inches on any story of a 3-story house, refer to the continuously sheathed method in the IRC (R602.10.5).

Wall bracing and shear walls provide resistance to the powerful lateral forces of high winds and earthquakes. A building constructed with wood sheathing on all the exterior walls (left) has more lateral strength and resistance than a similar building with non-structural wall sheathing (right).



The APA Narrow Wall Bracing Method

A BETTER WAY TO BUILD, ALL THE WAY AROUND.

APA's site-built solution is simple and cost effective. It requires no special components or connections, yet offers architectural flexibility and structural performance that is equivalent to prescriptive code bracing units. When the home is fully sheathed with plywood or OSB and the narrow wall segment is properly installed, braced garage wall sections can be as narrow as 16 inches and hold-downs are not required. It's a whole-house solution that delivers strength at the garage door openings, and all the way around the house.

APA has conducted full-scale structural tests of the narrow wall bracing method at its state-of-the-art research laboratory. The APA bracing design demonstrated equivalent strength and stiffness when compared to the prescriptive braced wall units currently permitted by code.

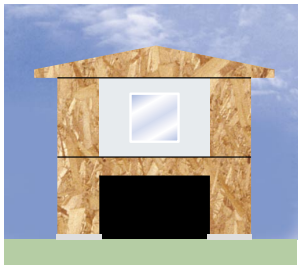
There are two primary components to the narrow wall bracing method:

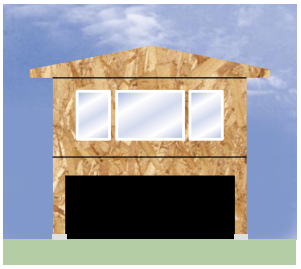
1. Fully sheath the exterior walls with structural wood panels. A fully sheathed home – that is, a home with the entire sheathable area of the exterior of the structure continuously covered in plywood or OSB – provides superior structural performance over homes sheathed with non-structural products.

2. Install a header that extends beyond the garage opening to the corner framing. Once lapped by wall sheathing, the header forms a semi-moment-resisting frame. This configuration, sometimes referred to as a portal frame, provides additional resistance to wind and earthquake forces. It enables the wall leg of the frame to be narrower than otherwise required and still transfer the shear load of conventional corner bracing prescribed in the code.

Figures 2a, 2b, and 2c illustrate the nailing, attachment and material requirements for the system. APA recommends that these details are limited to garage door openings in one-story buildings or in the first story of two-story buildings located in regions with seismic design categories A through C.

For more information about corner bracing and APA testing of its Narrow Wall Bracing Method, refer to APA Technical Topic TT-073 and Technical Note E425. Engineering design values for the Narrow Wall Bracing Method with hold-downs are found in APA Technical Topic TT-074. These documents can be accessed at www.apawood.org/bracing.

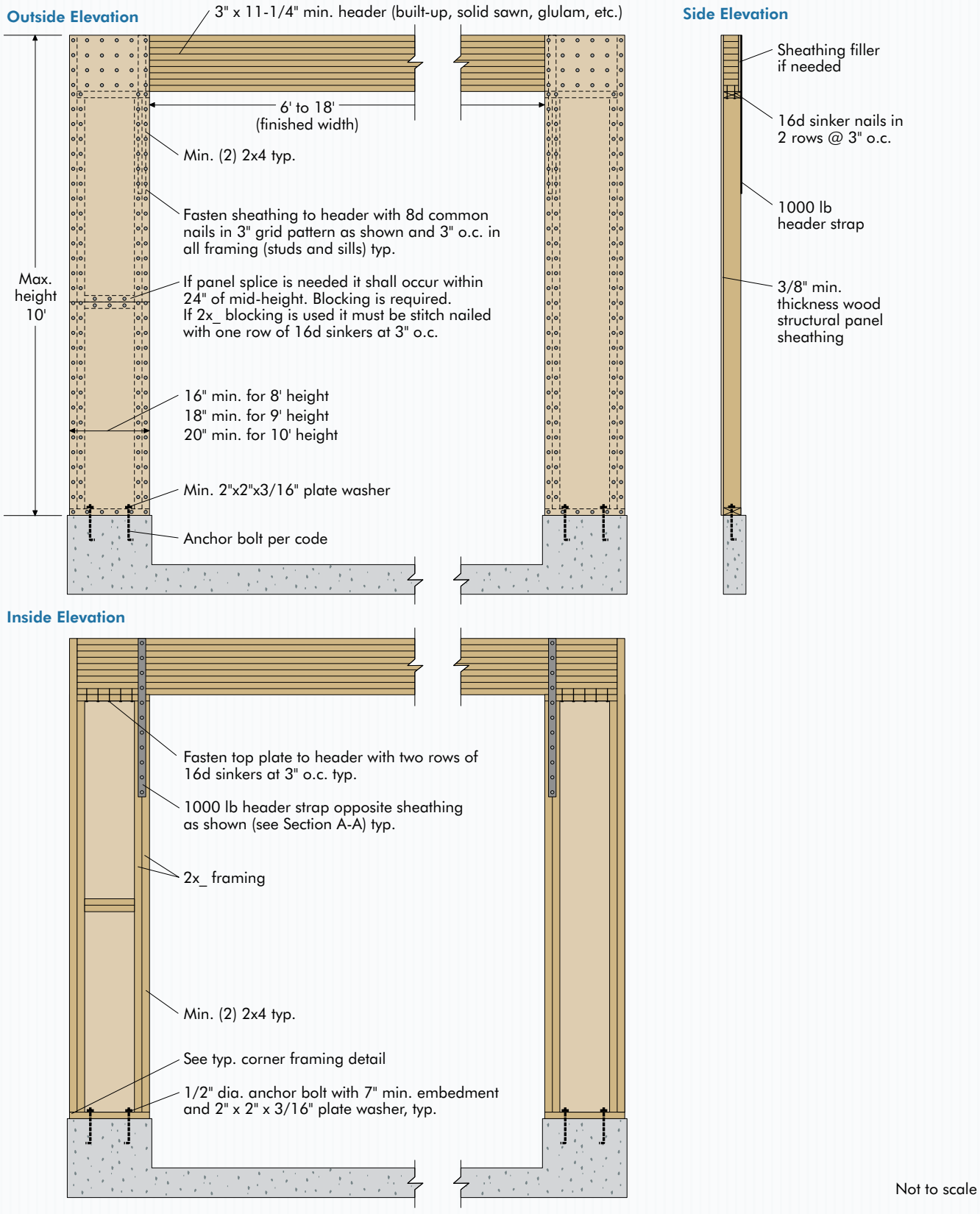




If a builder wants to avoid using hold-down devices he must install 48-inch walls adjacent to the garage when foam, laminated fiber, or other nonstructural wall sheathing is used between structural panel corner bracing (left). When OSB or plywood sheathing is used on all exterior walls, the builder can reduce the braced wall width to 16 inches on the garage and 24 inches on the house (see IRC R602.10.5).

FIGURE 2a

GARAGE NARROW WALL BRACING METHOD WITHOUT HOLD-DOWNS (two segments shown)

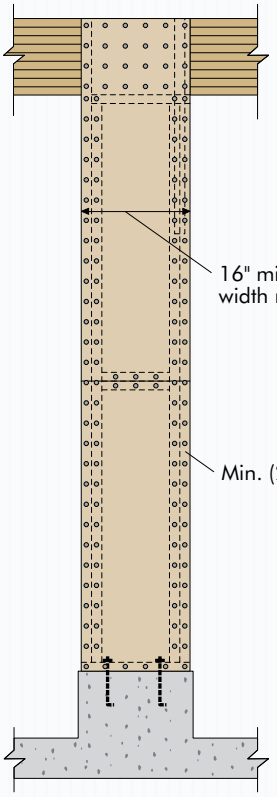


Not to scale

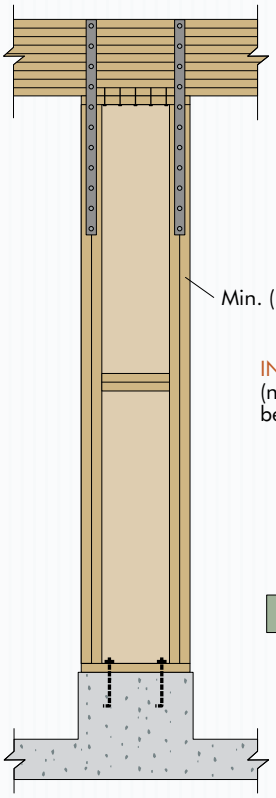
FIGURE 2b

GARAGE NARROW WALL BRACING METHOD WITHOUT HOLD-DOWNS (one segment shown)

Outside Elevation



Inside Elevation



INTERMEDIATE BRACING
(note: a bracing unit may not be required at this point)

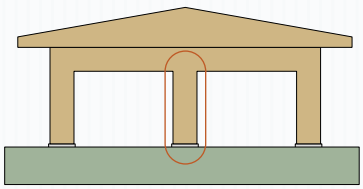
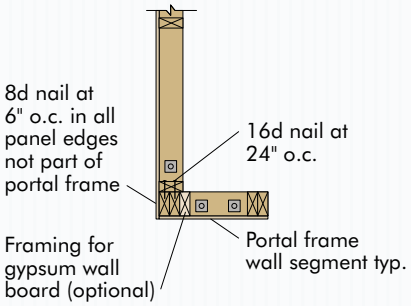
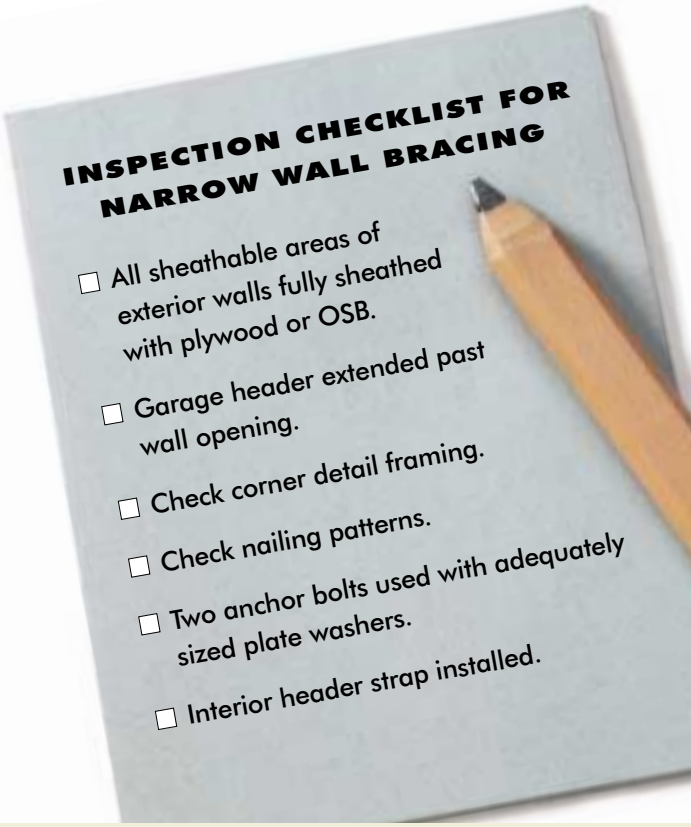


FIGURE 2c

CONSTRUCTION REQUIREMENTS FOR GARAGE NARROW WALL BRACING METHOD WITHOUT HOLD-DOWNS

Plan View of Corner Detail





Good for the Whole House

The Narrow Wall Bracing Method and the continuously sheathed method in the IRC solve the problem of meeting code with braced walls at garage door openings. Plus, with OSB or plywood sheathing all the way around the house, the builder achieves a stronger home, with numerous value-adding features:

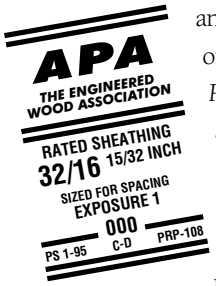
ADVANTAGES OF A FULLY-SHEATHED HOME

- Allows for more **design flexibility** around openings; builders and designers can accommodate more window and door openings while continuing to meet or exceed the demands for wall bracing required by the building code.
- Helps builders to cost effectively be **equivalent to code requirements** for wall bracing even while using narrow walls
- Helps **prevent racking** caused by high winds and earthquake forces
- Provides a **solid nail base** and continuous coverage between framing elements for common siding products, which results in a smooth, even appearance of the finished siding
- Adds **stiffness** and reduces flexing that can cause nail pops and cracks in the drywall, thus reducing callbacks
- Keeps walls **straight and square** during construction
- Provides **security** and a deterrent to burglars who have been known to cut or kick through other lightweight wall sheathing materials
- Helps **protect** the structure against airborne debris in high winds
- **Reduces holes in sheathing** due to jobsite damage or vandalism, minimizing time-consuming repairs.
- Helps **prevent stucco cracking** and callbacks
- Provides an **excellent noise barrier** when used in combination with insulated wood-framed walls and exterior siding products

The Narrow Wall Bracing Method includes a garage door header that extends to the corner framing and exterior walls that are fully sheathed with plywood or OSB. The narrow wall sections are easy to install with standard tools and connectors.

ABOUT *APA – THE ENGINEERED WOOD ASSOCIATION*

APA – The Engineered Wood Association is a nonprofit trade association whose member mills produce a majority of the structural wood panel products manufactured in North America.



The Association's trademark appears only on products manufactured by member mills and is the manufacturer's assurance that the product conforms to the standard shown on the trademark. That standard may be an APA performance standard, the *Voluntary Product Standard PS 1-95 for Construction and Industrial Plywood* or *Voluntary Product Standard PS 2-92, Performance Standards for Wood-Based Structural-Use Panels.* Panel quality of all APA trademarked products is subject to verification through APA audit.

APA's services go far beyond quality testing and inspection. Research and promotion programs play important roles in developing and improving plywood and other panel construction systems, and in helping users and specifiers to better understand and apply panel products.

Always insist on panels bearing the mark of quality – the APA trademark. Your APA panel purchase is not only your highest possible assurance of product quality, but an investment in the many trade services that APA provides on your behalf.

For additional information on wood construction systems, contact *APA – The Engineered Wood Association,* P.O. Box 11700, Tacoma, Washington 98411-0700. Visit us on the World Wide Web at www.apawood.org. For a list of additional APA and Engineered Wood Systems publications, request the *APA Publications Index,* Form B300.

We have field representatives in many major U.S. cities and in Canada who can help answer questions involving APA trademarked products. For additional assistance in specifying engineered wood products, contact us:

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